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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,110	08/07/2003	Arne W. Ballantine	END9-2000-0063US2	1577

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SCHMEISER, OLSEN + WATTS
SUITE 201
3 LEAR JET
LATHAM, NY 12033

EXAMINER

PHAN, THIEM D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/636,110

Applicant(s)

BALLANTINE ET AL.

Examiner

Tim Phan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,15,17,19,21-25,28 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,15,17,19,21-25,28 & 31-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/703</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1, 3-9, 15, 17, 19, 21-25, 28 and 31-33 are objected to because of the following informalities: "resister" (Claim 1, line 7) should be "resistor". Appropriate correction is required.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 3-9, 15, 17, 19, 21-25, 28 and 31-33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-32 of U.S. Patent No. 6,647,614 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because in the claims 1, 3-9, 15, 17, 19, 21-25, 28 and 31-33, for example, there is merely obvious variation of an invention claimed in claims 1-32 of U.S. Patent No. 6,647,614 B1.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 1, 3-9, 15, 17, 19, 21-25, 28 and 31-33 are further rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, since the specifications as written fails to provide examples, fails to provide specific composition or the like an artisan would be hard pressed to make or use the claimed invention.

Applicants have not disclosed any elements such as the specific compositions of the laser radiation, its power density, the heat distribution, the laser device such as Nd:YAG laser ?, the optimized laser conditions, the amount of heat needed to modify the resistance of the exposed resistor portion, the reacting temperature of the resistive materials and the like ... , and therefore it is held that an artisan would not be able to carry out the claimed invention without undue experimentation. What is the range of possible resistivities ? What isomeric forms of the composition will make this invention work ? This is unknown and Applicants fail to provide such information. Applicants perhaps can submit an Affidavit from those having ordinary skill in the material sciences as well as the semiconductor making and measurement arts to overcome this rejection. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3-8, 15, 17, 19, 22-24 and 32 are further rejected under 35 U.S.C. 102(b) as being anticipated by Gofuku et al (IEEE 0569-5503/91/000-0524) hereinafter '524.

As applied to claim 1, the '524 teaches a process of manufacturing a buried based resistor in copper-polyimide substrate, comprising:

- providing a resistor (Cf. Fig. 3, TFR) having a length L and a first electrical resistance R.sub.1 (Cf. Fig. 4); and
- exposing a portion of the resistor (Cf. Paragraph 3-1, lines 1 ff.) to a laser radiation for a time of exposure, wherein the portion of the resistor (Cf. Fig. 1, TFR) includes a fraction F of the length L is exposed through the transparency of the polyimide film (Cf. Fig. 1, Base PI), wherein at an end of the time of exposure the resistor has a second electrical resistance R.sub.2, and wherein R.sub.2 is unequal to R.sub.1, and wherein after completion of said exposing the portion of the resistor to the laser radiation for the time of exposure, the portion of the resistor continues to be comprised by the resistor and contributes to the second electrical resistance R.sub.2, while no groove is cut into the resistor.

As applied to claims 3-8, the '524 teaches that the resistor reacts and varies with the laser process (Cf. Table 1; Fig. 7; Page 527, lines 4 ff.).

As applied to claims 15 and 17, the '524 teaches that the laser radiation effectively modifies the amorphous metallic material RuO₂ into lead-borosilicate glass (Cf. Fig. 8 & 9, b; Page 527, lines 25 ff.).

As applied to claim 19, the '524 teaches that the resistor in the providing step includes a metallic oxide selected from the group consisting of a metal oxide and a metallic alloy oxide

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such as RuO₂ (Cf. Paragraph 2-1, lines 1-4), wherein the exposing step reacts a portion of the metallic oxide to form a metallic component and oxygen gas (Cf. Page 529, paragraph 3-3, lines 1-6) within the portion of the resistor, wherein the metallic component is the metal if the metallic oxide is the metal oxide.

As applied to claims 22 and 23, the '524 teaches that the exposure of the portion of the resistor to the laser radiation for an additional period of time or shot number of laser pulse (Cf. Fig. 7; page 527, lines 7 ff.) could result in the resistor having electrical resistances that differ or equal from the other resistances.

As applied to claim 24, the '524 teaches that the resistor (Cf. Fig. 1, TFR) is coupled to the substrate (Cf. Fig. 1) used in high-density packaging and high speed signal transmission semiconductor or device (Cf. Page 524, paragraph 1, lines 15 ff.).

As applied to claim 32, the '524 teaches that the laser radiation is a shorter duration pulse (Cf. Page 530, paragraph 3-3, lines 10 ff.).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 9, 28, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '524.

As applied to claim 9, the '524 teaches a process of manufacturing a buried based resistor in copper-polyimide substrate which reads on applicants' claimed invention, except for having the width F and the length L of the resistor at 1 micron size.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the width F and the length L of the resistor at 1 micron size, since it is known in the art that the wavelength applied in the laser process is approximately 1 micrometer (Cf. Page 526, paragraph 3-1, lines 12 ff.). Thus it can affect any material starting from that size.

As applied to claims 28 and 31, the '524 teaches a process of manufacturing a buried based resistor in copper-polyimide substrate which reads on applicants' claimed invention, except for measuring, testing and laser-irradiating the resistor to obtain the targeted value.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to measure, test and laser-irradiate the resistor to obtain the targeted value during the laser process, since it is known in the art that critical data of different radiation and varied resistances are recorded (Cf. Page 527, Fig. 7, lines 4 ff.) to optimize the laser process.

As applied to claim 33, the '524 teaches that there is conductively coupling of a first electrically conductive contact or electrode (Cf. Fig. 1, left electrode) to the resistor (Cf. Fig. 1,

TFR); there is a conductively coupling of a second electrically conductive contact or electrode (Cf. Fig. 1, left electrode) to the resistor (Cf. Fig. 1, TFR); except for conductively coupling an electrical circuit element to the first electrically conductive contact and to the second electrically conductive, wherein an electrical circuit is formed such that the electrical circuit includes the electrical circuit element and the resistor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to conductively couple an electrical circuit element to the first electrically conductive contact and to the second electrically conductive, wherein an electrical circuit is formed such that the electrical circuit includes the electrical circuit element and the resistor, since it is known and is old in this art that a resistor can be applied in a high-density packaging and in high speed signal transmission semiconductors or devices (Cf. Page 524, paragraph 1, lines 15 ff.).

Objected Subject Matter

10. Claims 21 and 25 are objected to as being dependent, provided a proper Terminal Disclaimer is also filed, upon a rejected base claim, but would be allowable if rewritten to overcome the above rejection and in independent form including all of the limitations of the base claim and any intervening claims.

Furthermore the Office saith not.

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Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 703-605-0707. The examiner can normally be reached on M - F, 9AM - 5PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.



Tim Phan
Examiner
Art Unit 3729

tp
May 7, 2004


CARL J. ARBES
PRIMARY EXAMINER